

SUMMARY

Neurological block of the brachial plexus in the axilla has been described. This method of anæsthesia is of particular value in children where it may be combined with a light hypnotic state. Such a technique can be of great value in the out-patient department. It overcomes the danger of a full stomach, shortens hospital stay and has no serious complications. The block can be performed readily and should have a high success rate for the occasional user. It allows the use of a tourniquet. Since pneumothorax is not a problem, this block may be used bilaterally.

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RÉSUMÉ

Les auteurs commentent une technique d'anesthésie des nerfs du bras dans la région axillaire qu'ils ont employée chez plus de cent malades. Ce procédé est très utile chez les petits enfants surtout si on y ajoute comme dans la présente série un léger état d'hypnose. Il permet l'application d'un garrot et se prête à la plupart des interventions chirurgicales au-delà du coude. L'anesthésie fut obtenue par injection périartérielle d'une solution de 1 ou 2% de lidocaïne dans le voisinage de l'artère axillaire à la marge inférieure de cette région. On pratiqua l'injection à l'aide d'une aiguille No. 25 de 2 cm. de long. La plupart des 5% d'échecs se comptèrent chez les adultes. Il n'y eut aucune complication sauf une légère sensibilité à l'endroit de l'injection. Cette technique permet d'éviter les risques que présente chez les enfants l'anesthésie d'un sujet qui n'est pas à jeun.

Case Reports

SUBDURAL HÆMATOMA
COMPLICATING ANTICOAGULANT
THERAPY

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THE HAZARDS of hæmorrhage from the use of anti-coagulants have been well documented. Their use in the prevention of a thromboembolic phenomenon is recognized, but the possibility of hæmorrhage is a calculated risk. This possibility must always be weighed against the benefits.¹

This report concerns subdural hæmatoma complicating anticoagulant therapy, a rare but serious complication. Report of a case with bilateral involvement and subsequent recovery after surgery is given, and the literature is reviewed.

A.F., a 75-year-old Jewish man, was admitted by ambulance to St. Boniface Hospital in the afternoon of November 7, 1955. He was confused and stuporous, but responded to painful stimuli. His previous history revealed that he had an acute posterior myocardial infarction on July 22, 1955, and was placed on long-term anticoagulant therapy in the form of bishydroxycoumarin (Dicoumarol).

His present illness began on November 1, 1955, with severe frontal headache, unrelieved by analgesics. Two days later he developed urinary incontinence and mental confusion. He also began to vomit. On admis-

sion, the following pertinent physical findings were noted. The left pupil was fixed and enlarged; the pulse rate was 62 per minute; the blood pressure (B.P.) was 150/80 mm. Hg, and a positive plantar response (Babinski) was present on the left side. There was no history of head injury or of previous cerebrovascular accident.

The prothrombin time was 47 seconds (10%). Skull films showed the calcified pineal body to be midline in position, but lower and more posterior than usual. His chest radiograph was reported as normal.

In the early morning of November 8, 1955, he responded poorly, although he was conscious. The nurse noted bloody urine and he had vomited dark red fluid. By noon, respirations were of Cheyne-Stokes type. At 2.30 p.m. the same day, ventriculography was done; air was introduced through a twist drill hole in the right parietal bone. Films revealed a marked shift from left to right of the right lateral ventricle and the third ventricle, with marked depression particularly in the anterior portion. The basilar cisterns were markedly compressed. No air was present in the left lateral ventricle. The findings were reported as non-specific, but suggested a large space-occupying lesion, possibly a subdural hæmatoma, on the left side. The ventricular fluid was clear and colourless, with a protein value of 18 mg. %. Microscopically, many red blood cells were noted in this fluid.

Bilateral burr holes were performed shortly after. A large subdural hæmatoma was found on the left side. There was also a subdural hæmatoma on the right side, containing three separate membranes. The hæmatomas were evacuated. The patient was conscious postoperatively. His pupils were equal and both plantars were flexor in response. He received 50 mg. of vitamin K₁ (Mephyton) intravenously, and the prothrombin time was 14.5 seconds (70%) the following day.

The headache continued but was less severe. After further intravenous vitamin K₁, his prothrombin time was 14.2 seconds (90%) on November 11. On the next day, he was up walking for short periods.

On November 13, he felt less steady on his feet and his speech was noticeably less clear. He became

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TABLE 1.—SUMMARY OF CASES OF SUBDURAL HÆMATOMA COMPLICATING ANTICOAGULANT THERAPY REPORTED IN THE LITERATURE

Author	Age	Sex	Indication for anticoagulation	Associated conditions	Complications	Lowest prothrombin time	Days after onset of anticoagulation	Outcome	Autopsy findings
Shlevin and Lederer ²⁷	79	F	Right retinal vein thrombosis	Long-standing hypertension; chronic anemia	Hæmaturia; bleeding gums; ecchymoses; heart failure; atrial fibrillation and coma	360+ sec. (normal control not given)	28	Death	Bilateral subdural hæmatomas; clotted blood in base of skull; hæmorrhages in subarachnoid space, retroperitoneal tissues, renal pelvis, urinary bladder, stomach and duodenum
Nathanson <i>et al.</i> ²⁸	69	M	Embolization	Hypertension; arrhythmia; atrial fibrillation	Occipital headache; fixed pupils; coma; xanthochromic CSF, later bloody; ankle clonus; absent corneal reflexes; hyper-reflexia	21 sec. (normal control not given)	6	Death	Subdural clot over left parietal lobe; hæmorrhage in corpus callosum, tegmentum, base of pons and lower midbrain
	64	M	Previous coronary occlusion followed by atrial fibrillation. Recurrence of substernal pain	—	Frontal headache; irritable, confused, disoriented; left facial weakness; pineal body shifted to the left; diagnosis of right subdural hæmatoma made	54 sec. (normal control not given)	30	Bilateral burr holes revealed bilateral subdural hæmatomas. Patient recovered	—
	65	F	Phlebitis of legs	—	Headache; lethargy; confusion; disoriented; neck rigidity; micturition hæmaturia; blood-tinged CSF; bilateral subdural hæmatomas diagnosed on basis of right carotid angiogram	71 sec. (normal control 12 sec.)	48	Surgery twice. Patient died	Site of bilateral subdural hæmatomas confirmed, no residual clot
Eisenberg ²⁹	56	M	Myocardial infarction twice	Mild diabetes mellitus and mild congestive heart failure	Dilated, fixed right pupil; left side of face and body flaccid; bilateral Babinski response; coma	8% (normal control not given)	70	Patient died postoperatively	Right subdural hæmatoma over temporal lobe
Baron ²³	60	F	Pulmonary embolization	Hypertension; cardiomegaly; obesity	Headache; coma; right pupil dilated; right limbs flaccid; CSF bloody	38.2 sec. (normal control 12 sec.)	23	Death	Subdural hæmatoma over right frontal and parietal lobes; hæmorrhage in tegmentum of pons and midbrain; caudally ruptured into 4th ventricle; blood in subarachnoid space over right frontal lobe

Dicoumarol was the anticoagulant involved in the above cases.

drowsy, and his left pupil was seen to be larger. A positive plantar sign (Babinski) was again present on the left side.

The prothrombin time on the following day was 13.8 seconds (100%). From then on there was progressive improvement, and he was discharged on December 9, 1955, in good condition.

This patient did well until August 5, 1958, when he suffered another myocardial infarction. On August 12, 1958, he had a recurrence of severe chest pain and died the next morning from intractable congestive heart failure. Permission for post-mortem examination was not obtained.

DISCUSSION

Contraindications to the use of anti-coagulants are many. The most important ones are lack of adequate laboratory facilities and trained technicians, lack of experience and competence on the part of the physician, and lack of patient co-operation and intelligence.²

Certain contraindications have been listed by different authors.^{2, 8}

A. Medical: (1) Purpuras of any kind. (2) Blood dyscrasias and bleeding tendencies. (3) Severe hypertension, particularly with a history of previous cerebrovascular accidents. (4) Active or imminent ulcerative or bleeding lesions of the gastro-intestinal or genito-urinary tract. (5) Subacute bacterial endocarditis.

B. Surgical: (1) Brain and spinal cord surgery. (2) Large, open, raw surfaces with poorly controlled hæmostasis. (3) Deep needle-puncture procedures, e.g. lumbar sympathetic blocks.

C. Obstetrical and gynæcological: (1) Recent threatened abortion. (2) Incomplete abortion. (3) Pregnancy near term.

Cautious use is advised in patients with chronic congestive heart failure, hepatic insufficiency, and renal disease, and in nutritional deficiencies.^{2, 3, 8-11}

Factors that may modify the stability of prothrombin time include infections, diarrhoea, shock, menstruation, excessive alcoholic consumption, vitamin C deficiency, and administration of large amounts of salicylates, sulfonamides, and bowel-sterilizing antibiotics.²

Jaques¹² claims that stress through its effect on blood vessels is one of the commonest exciting causes of hæmorrhage. Differences in individual susceptibility, as suggested by Prandoni and Wright,¹³ may be responsible in part for hæmorrhagic responses.

Other complications besides bleeding are agranulocytosis,¹⁴ purpuric forma-

tion,¹⁵ hypersensitivity reaction, hepatitis, jaundice and leukæmoid reaction.^{16, 17} Side reactions such as diarrhoea, dryness of mouth, polydipsia, polyuria and tachycardia may occur.²

Hæmorrhage accompanying anticoagulant therapy may present as microscopic or gross hæmaturia, epistaxis, gingival bleeding, conjunctival hæmorrhage, cutaneous ecchymosis, hæmatoma, hæmoptysis, hæmarthrosis, periosteal hæmorrhage, and bleeding into the pericardial sac, pleural cavity, uterine cavity, gastro-intestinal tract and retroperitoneal tissue.^{2, 7, 18-23}

Hæmorrhage may occur in the central nervous system during anticoagulant therapy, particularly in hypertensives with previous cerebrovascular accidents.²³ These may be intracerebral,^{3, 7, 23-25} intracerebellar,²³ intraventricular,^{23, 26} subarachnoid,^{7, 23, 27} subdural,^{23, 27-29} or intraspinal³⁰ or extradural hæmorrhage of the spinal cord,³¹ or hæmorrhage in the mid-brain, pons or medulla oblongata.^{23, 28}

Six cases of subdural hæmatoma complicating anticoagulant therapy have been found in the literature. Three of the cases had bilateral subdural hæmatomas, and only one patient survived. Table I is a summary of these cases.

In each of these patients the prothrombin time was prolonged beyond the safety margin. This emphasizes the importance of careful supervision of patients during anticoagulant therapy and the necessity of frequent readjustment of dosage according to accurate prothrombin-time determinations.

Three of the patients had evidence of hypertension. In Barron's²³ review of the literature on intracranial hæmorrhage from anticoagulants, he pointed out that six of the 58 cases were of hypertensives. These were associated with fatal intracerebral hæmorrhage. Of the six patients he reported, two were hypertensive, and one was receiving anticoagulant therapy at the time of fatal hæmorrhage.

Apparently none of the patients gave any history of head injury, nor was there any clinical evidence of such. No doubt the possibility of minor or trivial trauma to the head directly or indirectly, which might have initiated bleeding intracranially, cannot be entirely excluded. Of course, with evidence of head injury in patients receiving anticoagulants, added suspicion of subdural hæmatoma must be raised in view of the seriousness of this complication and the high mortality rate. Three of the six cases reported in the literature had bilateral involvement of the subdural space. Only one patient survived. As far as we know, our case is the second one that was treated successfully for bilateral subdural hæmatomas complicating anticoagulant therapy.

In all the cases with subdural involvement, the anticoagulant concerned was bishydroxycoumarin.

With more widespread use of other anticoagulants, this complication will eventually follow their use also.

The incidence of hæmorrhages in patients on anticoagulant therapy ranges between 5.7 and 42%, reported by different investigators.^{20, 24, 32} Most of these are minor hæmorrhages. Major hæmorrhagic complications are rare.^{2, 10} They are usually not dangerous, and can be easily controlled by vitamin K.^{2, 9} Nevertheless, one must bear in mind the possibility of fatal results.

SUMMARY

A case of bilateral subdural hæmatomas in association with bishydroxycoumarin therapy, with subsequent recovery, is reported.

A review of the literature concerning contraindications to the use of anticoagulants and the hæmorrhagic complications resulting from anticoagulant therapy is presented, with emphasis on central nervous system involvement.

The possibility of fatal hæmorrhage accompanying anticoagulant therapy must be kept in mind.

The correct diagnosis in this case was first suggested by Dr. R. T. Ross. The surgery was performed by Dr. D. Parkinson.

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